**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

| | |
|---|---|
| NO.: NR-***-S-***-S | DATE:<br>PAGE 1 of 5 |
| SOURCE TYPE: | *Short description of the source type* |
| MODEL: | *ABC* |
| MANUFACTURER/DISTRIBUTOR: | *Name*<br>*Street*<br>*City, State Zip*<br>*(If manufacturer and distributor are the same, keep subheading as shown. If different, delete the word manufacturer from the subheading.)* |
| MANUFACTURER: | *Name*<br>*Street*<br>*City, State Zip*<br>*(This subheading and information is not necessary if manufacturer and distributor are the same.)* |
| ISOTOPE: | MAXIMUM ACTIVITY: |
| *List Isotopes* | *xx millicuries (xx Gbq)*<br>*Units should be such that the amount is in the 1 to 999 range* |
| LEAK TEST FREQUENCY: | *Not Required*<br>*6 Months* |
| PRINCIPAL USE: | *(A) Industrial Radiography from listing in Regulatory Guide 10.11* |
| CUSTOM SOURCE: | □ Yes ⊠ No |
| CUSTOM USER: | *Name*<br>*Street*<br>*City, State Zip* |

*(Delete entire subsection if not applicable.)*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-S-***-S DATE:
PAGE 2 OF 5

SOURCE TYPE: *Short description of the source type*

DESCRIPTION: *Provide the complete description of the source*

LABELING:

*The source is engraved with the radiation symbol, isotope, activity, model number, serial number, date of assay, name of the distributor, and the words "CAUTION-RADIOACTIVE MATERIAL." The text is X″ (X mm) high and is on the end/side of the source capsule.*

DIAGRAM:

*Reference all attachments to the document including the total number of attachments.*

CONDITIONS OF NORMAL USE:

*The source is designed and manufactured for use in measuring. . .*

*The source may be used in harsh environments but shall not be subjected to environments that exceed its ANSI N542-1977 classification, 77C00000.*

PROTOTYPE TESTING:

*A prototype of the Model ABC source was constructed and subjected to the tests provided in ANSI N542-1977/ISO 2919 and achieved a classification of 77C00000.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-S-***-S DATE:
PAGE 3 OF 5

SOURCE TYPE: *Short description of the source type*

EXTERNAL RADIATION LEVELS:

*The following dose rates were reported by the manufacturer for the Model ABC source containing 1.0 curie (37 GBq) of Am-241:*

*Table 1*

| | | ***Maximum Radiation Level*** | | | |
|---|---|---|---|---|---|
| ***Distance*** | | ***From Window*** | | ***From Sidewall/Back*** | |
| *(inches)* | *(cm)* | *(mR/hr)* | *($\mu$Sv/hr)* | *(mR/hr)* | *($\mu$Sv/hr)* |
| *1.97* | *5* | | | | |
| *11.81* | *30* | | | | |
| *39.37* | *100* | | | | |

QUALITY ASSURANCE AND CONTROL:

*XXXXXX maintains a quality assurance and control program which has been deemed acceptable for licensing purposes by NRC. A copy of the program is on file with NRC.*

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- *The source shall be distributed to persons specifically licensed by NRC or an Agreement State.*
- *The device shall only be used by the custom user listed in this certificate, XXXXX.*
- *Handling, storage, use, transfer, and disposal: To be determined by the licensing authority.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-S-***-S DATE:
PAGE 4 OF 5

SOURCE TYPE: *Short description of the source type*

- *Handling, storage, use, transfer, and disposal: To be determined by the licensing authority. In view that these sources exhibit high dose rates, the sources should be handled by experienced licensed personnel using adequate handling equipment and procedures.*
- *The source shall be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcurie (185 Bq) of removable contamination.*
- *The source shall not be subjected to conditions that exceed its ANSI N542-1977 classification, 77C00000.*
- *This registration sheet and the information contained within the references shall not be changed without the written consent of NRC.*

SAFETY ANALYSIS SUMMARY:

*Based on review of the Model ABC sealed source, its ANSI classification, and the information and test data cited below, we [continue to] conclude that the source is acceptable for licensing purposes.*

*Furthermore, we [continue to] conclude that the source would be expected to maintain its containment integrity for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-S-***-S DATE:
PAGE 5 OF 5

SOURCE TYPE: *Short description of the source type*

REFERENCES:

*The following supporting documents for the Model ABC sealed source are hereby incorporated by reference and are made a part of this registry document.*

- *Application dated December 25, 2000, with enclosures thereto.*
- *Letters dated July 4, 1996, and December 25, 2000, with enclosures thereto.*
- *Facsimiles dated July 4, 1996, and December 25, 2000.*

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____ Reviewer: _____
*Name of 1st Reviewer*

Date: _____ Concurrence: _____
*Name of 2nd Reviewer*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF DEVICE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-S-***-S DATE:

ATTACHMENT 1

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

| | |
|---|---|
| NO.: NR-***-D-***-X | DATE:<br>PAGE 1 OF 8 |
| DEVICE TYPE: | *Short description of the source type* |
| MODEL: | *ABC* |
| MANUFACTURER/DISTRIBUTOR: | *Name*<br>*Street*<br>*City, State Zip*<br>*(If manufacturer and distributor are the same, keep subheading as shown. If different, delete the word manufacturer from the subheading.)* |
| MANUFACTURER: | *Name*<br>*Street*<br>*City, State Zip*<br>*(This subheading and information is not necessary if manufacturer and distributor are the same.)* |
| SEALED SOURCE MODEL DESIGNATION: | *ACME Model 123* |
| ISOTOPE: | MAXIMUM ACTIVITY: |
| *List Isotopes* | *xx millicuries (xx Gbq) Units should be such that the amount is in the 1 to 999 range* |
| LEAK TEST FREQUENCY: | *Not Required*<br>*6 Months* |
| PRINCIPAL USE: | *(A) Industrial Radiography from listing in Regulatory Guide 10.10* |
| CUSTOM DEVICE: | □ YES ⊠ No |
| CUSTOM USER: | *Name*<br>*Street* |

*City, State Zip*
*(Delete entire subsection if not applicable.)*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 2 OF 8

DEVICE TYPE: *Short description of the source type*

DESCRIPTION:

*Provide the complete description of the device and, if necessary, the source(s) used in the device.*

LABELING:

*The device is labeled in accordance with 10 CFR 20.1901. The labels contain the radiation symbol, isotope, activity, model number, serial number, name of the distributor, and the words "CAUTION-RADIOACTIVE MATERIAL."*

*When distributed to persons generally licensed, the device is additionally labeled in accordance with 10 CFR 32.51.*

*The labels are made of stainless steel or aluminum, rectangular in shape, X″ x X″ (X cm x X cm), and are permanently attached by rivets or screws to the device. A copy of the label is shown in attachment X.*

DIAGRAM:

*Reference all attachments to the document including the total number of attachments.*

CONDITIONS OF NORMAL USE:

*The source is designed and manufactured for measuring. . .*

*The devices are expected to be subjected to environments typically found in laboratories occupied by humans. Since the device is portable, it may experience vibration and shock typical during normal transportation.*

*The device will only be used by XXXX at their XXXXX CITY, STATE facility.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 3 OF 8

DEVICE TYPE: *Short description of the device type*

CONDITIONS OF NORMAL USE (Cont.):

*The devices are intended for use in industrial gauging applications. The devices are typically used in industrial process control environments for the measurement of properties of materials in a tank or vessel. The devices are designed for the following environments:*

| | |
|---|---|
| *Temperature* | *-40° C to 60° C (-40° F to 140° F)* |
| *Pressure* | *Atmospheric* |
| *Vibration* | *Ranges from zero to mild* |
| *Corrosion* | *Ranges from zero to highly corrosive vapors* |
| *Fire* | *NEC Division 2 hazardous area possible* |
| *Explosion.* | *NEC Division 2 hazardous area possible* |

PROTOTYPE TESTING:

*A prototype of the Model XXXX was constructed and subjected to the tests listed below. No malfunction occurred nor was there any loss of shielding or containment integrity.*

| | |
|---|---|
| *Temperature* | *110° C (230° F) for a period of seven hours* |
| *Vibration* | *Approximately 30 cps at an amplitude of 0.03″ (0.76 mm) for 90 minutes* |
| *OFF/ON Mechanism* | *Operated by a pneumatic cylinder for a total of 9320 OFF/ON cycles* |
| *Impact* | *Dropped three times from a height of 4 feet* |
| *Penetration* | *Dropped a 13 pound (5.9 kg), 1-1/4″ (3.2 cm) diameter steel rod from a height of 40″ (102 cm)* |

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 4 OF 8

DEVICE TYPE: *Short description of the device type*

PROTOTYPE TESTING (Cont.):

*A prototype of the device has been tested in accordance with ANSI/ISO standard … and has achieved a classification of… The device passed the tests in accordance with the acceptance criteria included in the standard.*

*The sealed sources used in the device have been tested by their manufacturers and have achieved the following ANSI {N542-1977 or ANSI N5.10-1968} classifications:*

| *Manufacturer* | *Model* | *ANSI Classification* |
|---|---|---|
| *Amersham Corporation* | *AMCL* | *77C64344* |
| *DuPont Merck* | *NER-465* | *C33232* |
| *Isotope Products Laboratories* | *PH-55* | *C33232* |

*The sealed source contained in the device has achieved an ANSI N542-1977 classification of 77C00000.*

*The sealed source contained in the device has achieved an ANSI N5.10-1968 classification of C00000.*

EXTERNAL RADIATION LEVELS:

*XXXXXXXXX reports that the radiation levels from the device are not discernable from background.*

*XXXXXXXXX reports that the radiation levels from the device do not exceed 5 mR/hr (50 $\mu$Sv/hr) at 12″ (30.5 cm) from the surface of the device.*

*The following dose rates were reported by the manufacturer for the Model ABC transmission gauge containing a 1.0 curie (37 GBq) of Am-241 sealed source:*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 5 OF 8

DEVICE TYPE: *Short description of the device type*

EXTERNAL RADIATION LEVELS (Cont.):

*Table 1*

| | | ***Maximum Radiation Level*** | | | |
|---|---|---|---|---|---|
| ***Distance*** | | ***From Window*** | | ***From Sidewall/Back*** | |
| *(inches)* | *(cm)* | *(mR/hr)* | *(mSv/hr)* | *(mR/hr)* | *(mSv/hr)* |
| *1.97* | *5* | | | | |
| *11.81* | *30* | | | | |
| *39.37* | *100* | | | | |

*The dose rates were taken with no material present in the measuring area. XXXXXXX indicates this represents the highest radiation levels of any possible configuration.*

QUALITY ASSURANCE AND CONTROL:

*XXXXXX maintains a quality assurance and control program which has been deemed acceptable for licensing purposes by NRC. A copy of the program is on file with NRC.*

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- *The device shall be distributed to persons specifically licensed by NRC or an Agreement State.*
- *The device may be distributed to specific or general licensees of NRC or an Agreement State.*
- *The device shall be distributed to persons generally licensed by NRC or an Agreement State.*
- *The device shall only be distributed to the custom user, XXXXX.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 6 OF 8

DEVICE TYPE: *Short description of the device type*

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE (Cont.):

- *Handling, storage, use, transfer, and disposal: To be determined by the licensing authority.*
- *Handling, storage, use, transfer, and disposal: To be determined by the licensing authority or as required by 10 CFR 31.5 or Agreement State equivalent.*
- *The device shall be leak tested at intervals not to exceed 6 months using techniques capable of detecting 0.005 microcurie (185 Bq) of removable contamination.*
- *The Model XXXXXX sealed source is approved by NRC for use in the Model ABC. The source is not registered on a separate certificate.*
- *The generally licensed user is authorized to perform certain maintenance on the device (see the device operation manual). These services include. . .*
- *REVIEWER NOTE: Neither the distributor nor manufacturer of the device will provide servicing for the device.*
- *This registration sheet and the information contained within the references shall not be changed without the written consent of NRC.*

SAFETY ANALYSIS SUMMARY:

*The distributor has submitted sufficient information to provide reasonable assurance that:*

- *The device can be safely operated by persons not having training in radiological protection.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 7 OF 8

DEVICE TYPE: *Short description of the device type*

SAFETY ANALYSIS SUMMARY (Cont.):

- *Under ordinary conditions of handling, storage, and use of the device, the byproduct material contained in the device will not be released or inadvertently removed from the source housing, and it is unlikely that any person will receive in any period of one year a dose in excess of 10 percent of the limits specified in Section 20.1201(a), 10 CFR Part 20.*
- *Under accident conditions associated with handling, storage, and use of the source housing, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the dose to the appropriate organ as specified in the following chart:*

| *PART OF BODY* | *DOSE* |
|---|---|
| *Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye* | *15 rem (0.15 Sv)* |
| *Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 $cm^2$ (0.15 $in^2$)* | *200 rem (2.0 Sv)* |
| *Other organs* | *50 rem (0.50 Sv)* |

*Based on review of the Model ABC, and the information and test data cited below, we [continue to] conclude that the device is acceptable for licensing purposes.*

*Furthermore, we [continue to] conclude that the device would be expected to maintain its containment integrity for normal conditions of use and accidental conditions which might occur during uses specified in this certificate.*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF SEALED SOURCE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:
PAGE 8 OF 8

DEVICE TYPE: *Short description of the device type*

REFERENCES:

*The following supporting documents for the Model ABC are hereby incorporated by reference and are made a part of this registry document.*

- *Application dated December 25, 2000, with enclosures thereto.*
- *Letters dated July 4, 1996, and December 25, 2000, with enclosures thereto.*
- *Facsimiles dated July 4, 1996, and December 25, 2000.*

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____ Reviewer: _____
*Name of 1st Reviewer*

Date: _____ Concurrence: _____
*Name of 2nd Reviewer*

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF DEVICE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:

ATTACHMENT 1

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF DEVICE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-X DATE:

ATTACHMENT 2

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF DEVICE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-E

DATE:
PAGE 1 OF 2

DEVICE TYPE: *Smoke Detector/Gun Sight*

MODEL: *ABC*

MANUFACTURER/DISTRIBUTOR: *Name*
*Street*
*City, State Zip*
*(If manufacturer and distributor are the same, keep subheading as shown. If different, delete the word manufacturer from the subheading.)*

MANUFACTURER: *Name*
*Street*
*City, State Zip*
*(This subheading and information is not necessary if manufacturer and distributor are the same.)*

SEALED SOURCE MODEL DESIGNATION: *ACME Model 123*

| ISOTOPE: | MAXIMUM ACTIVITY: |
|---|---|
| *Americium-241* | *1.0 microcurie (37 kBq)* |
| *Hydrogen-3* | *60 millicuries (2.2 GBq)* |

LEAK TEST FREQUENCY: *Not Required*

PRINCIPAL USE: *(P) Ion Generator, Smoke Detectors*
*(W) Self-Luminous Light Sources*

CUSTOM DEVICE: ☐ Yes ☒ No

**REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES**
**SAFETY EVALUATION OF DEVICE**
**(AMENDED IN ITS ENTIRETY)**

NO.: NR-***-D-***-E DATE:
PAGE 2 OF 2

DEVICE TYPE: *Smoke Detector/Gun Sight*

DESCRIPTION:

*Provide a concise, basic description of the device and if more than one model is registered, provide the differences between models.*

REFERENCES:

*The following supporting documents for the Model ABC smoke detectors/gun sights are hereby incorporated by reference and are made a part of this registry document.*

- *Application dated December 25, 2000, with enclosures thereto.*
- *Letters dated July 4, 1996, and December 25, 2000, with enclosures thereto.*
- *Facsimiles dated July 4, 1996, and December 25, 2000.*

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: _____ Reviewer: _____

*Name of 1st Reviewer*

Date: _____ Concurrence: _____

*Name of 2nd Reviewer*